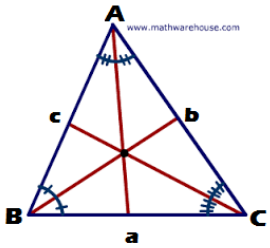
9. Rohan

Program Name: Rohan.java **Test Input File: rohan.dat**

In a recent geometry lesson on triangles and the various aspects they possess, Rohan needs help finding two interesting points – the incenter and the centroid. He also needs to find the area of any triangle, but he already knows Heron's formula and does not need help with that, which he remembers uses the semi-perimeter of the triangle in an interesting formula that takes the square root of the product of four things: the semi-perimeter itself, and the three differences between the semi-perimeter and each of the three sides a, b, and c. He also realizes he needs to use the distance formula to find the lengths of the sides a, b and c, but already knows that one too.

He decides to look up what those **incenter** and **centroid** mean, and discovers that an **incenter** is a point in the middle of any triangle where all three **angle bisectors** meet, and that the **centroid** is another point in the middle of the triangle where all the **medians** of a triangle meet. Below are diagrams illustrating these two points.



Incenter Centroid

In an online search, he finds formulas for these two interesting points, not fully comprehending how they work, but figures if he can code them correctly, he'll be OK.

The incenter formula for the Y value (YI) is a bit more complex:

YI = (a*Ya + b*Yb + c*Yc) / (a+b+c)

with a similar formula used for XI.

The centroid X value (XC) uses a formula that averages the three X coordinates (Xa, Xb, Xc) of the vertices of the triangle: **XC = (Xa + Xb + Xc)/3**
with the YC value using a similar formula.

Input: Several sets of six real number values no farther from zero than a distance of 100, representing the X and Y coordinates of three vertices of a triangle A, B, and C, in the order Xa, Ya, Xb, Yb, Xc, Yc.

Output: Two sets of coordinates representing the centroid and incenter of a triangle, and a third value representing the area, in the format shown below, with the two coordinate pairs included inside parentheses, separated by a comma with no spaces, and the area as a single real value. All values are to be expressed using rounded precision to the hundredths place.

Sample Input:

```
-2 4 4 2 0 -6
-2 7 7 4 1 -2
```

Sample Output:

```
(0.90,0.72)
(0.67,0.00)
28.00
(2.15,2.85)
(2.00,3.00)
36.00
```